# 21-GP1-078 Economic Impact Data Sheet

Briefly summarize your proposal's primary economic impacts and benefits to building owners, tenants and businesses.

To achieve state mandates of 70% energy use reduction by 2030, it will be necessary to incorporate some renewable energy into buildings to offset energy use. Renewable deployment needs to begin immediately to build up industry capacity to meet anticipated needs in the building sector over the next decade. This proposal starts down this path with modest renewable energy deployment requirements for commercial buildings. Renewable deployment also supports clean building and clean grid policies set by the state.

This proposal results in 3-17% electricity savings for tenants and businesses and annual operating energy costs savings between $1,140.98 to $25,253.58 while resulting in an increase in first cost to building owners. On-site renewable generation provides a layer of resiliency against utility blackouts and other climate-related power supply events. This resiliency benefit has not been included in the economic impact analysis below.

Provide your best estimate of the construction cost (or cost savings) of your code change proposal? (See OFM Life Cycle Cost **Analysis tool** and **Instructions;** use these **Inputs**. **Webinars on the tool can be found Here and Here**)

$Click here to enter text./square foot (For residential projects, also provide $Click here to enter text./ dwelling unit)

Show calculations here, and list sources for costs/savings, or attach backup data pages

**Data sources for PV installed cost:**

1. NREL. Solar Installed Cost Analysis. 2021. Accessed here: https://www.nrel.gov/solar/solar-installed-system-cost.html
2. SEIA. U.S. Solar Market Insight—2020 Year in Review. 2021. Accessed here: https://www.seia.org/research-resources/solar-market-insight-report-2020-year-review
3. CEC. PV and Battery Measure Proposal. 2021. Accessed here: https://efiling.energy.ca.gov/GetDocument.aspx?tn=237776

Using the sources above, we used an intermediate cost (not the lowest) of $1.72/Wdc installed cost for nonresidential PV systems. This installed cost is reported by NREL. The SEIA report on the U.S. market states a lower cost of $1.36/Wdc, whereas other sources report slightly higher cost. With the PV and battery measure for nonresidential new construction in California's energy code (to be adopted in June 2021), and global and U.S. trends for installed PV costs, it is likely PV costs will continue to reduce and will be lower than today's costs by the time this measure is enforced for buildings in Washington state.

**Energy and Cost Savings**

1. Prototypical buildings developed by PNNL were used to develop energy and energy cost savings. PV system size (kW) was calculated based on the floor area and the 0.50 W/sf requirement.
2. NREL's PVWatts tool was used to estimate the PV generation in Seattle, WA. It is likely that generation will be higher in eastern Washington, given the higher solar resource.

3. EIA's energy prices for Washington State in 2021 were used ($0.092/kWh).
4. A simple payback of 17 years was calculated based on the installed cost and annual energy cost savings.

| Prototype | Floor Area | # of Stories | kW Required | kWh Generation | Installed System Cost | Annual Energy Cost Savings | Simple Payback |
|---|---|---|---|---|---|---|---|
| Large Office | 498,000 | 13 | 249 | 273,900 | $428,280 | $25,253.58 | 16.95 |
| Medium Office | 53,600 | 3 | 27 | 29,480 | $46,096 | $2,718.06 | 16.95 |
| Small Office | 5,500 | 1 | 3 | 3,025 | $4,730 | $278.91 | 16.95 |
| Standalone Retail | 24,700 | 1 | 12 | 13,585 | $21,242 | $1,252.54 | 16.95 |
| Stripmall Retail | 22,500 | 1 | 11 | 12,375 | $19,350 | $1,140.98 | 16.95 |
| Primary School | 73,960 | 1 | 37 | 40,678 | $63,606 | $3,750.51 | 16.95 |
| Secondary School | 210,900 | 2 | 105 | 115,995 | $181,374 | $10,694.74 | 16.95 |
| Warehouse | 49,495 | 1 | 25 | 27,222 | $42,566 | $2,509.89 | 16.95 |
| Mid-rise Apartment | 33,700 | 4 | 17 | 18,535 | $28,982 | $1,708.93 | 16.95 |
| High-rise Apartment | 84,360 | 10 | 42 | 46,398 | $72,550 | $4,277.90 | 16.95 |

Provide your best estimate of the annual energy savings (or additional energy use) for your code change proposal?

Click here to enter text.KWH/ square foot (or) Click here to enter text.KBTU/ square foot

(For residential projects, also provide Click here to enter text.KWH/KBTU / dwelling unit)

Show calculations here, and list sources for energy savings estimates, or attach backup data pages

Energy savings calculations provided above.

List any code enforcement time for additional plan review or inspections that your proposal will require, in hours per permit application:

This proposal will require minor additional plan review to insure that a renewable energy system sized based on floor area is included. The renewable energy system will require field inspection per electrical permit requirements.